

WHAT IS CLAIMED IS:

1. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which the test sample is positively ionized therein by corona discharge is 110°C to 180°C; and a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry, wherein signals due to a chemical agent to be detected are detected.

2. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which the test sample is positively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring ionic strength due to a chemical agent to be detected.

3. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which the test sample is positively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence of ion) values corresponding to a chemical agent to be detected.

4. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is positively ionized therein by corona discharge is 110°C to 180°C; and a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry, wherein signals due to a chemical agent to be detected are detected.

5. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is positively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring ionic strength due to a chemical agent to be detected.

6. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is

positively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence of ion) values corresponding to a chemical agent to be detected.

7. An apparatus for detecting chemical agents according to any one of claims 1 to 6, wherein the aforesaid ion source is constructed so as to employ backflow type atmospheric pressure chemical ionization (APCI) in which the sample from the aforesaid sample introduction section flows toward a cat whisker capable of causing corona discharge.

8. An apparatus for detecting chemical agents according to any one of claims 1 to 6, wherein a drift voltage applied between small-hole-provided electrodes provided on both sides of the differential exhaust portion of the aforesaid mass spectrometry section is set at 50 V to 80 V.

9. An apparatus for detecting chemical agents according to any one of claims 1 to 6, wherein the aforesaid chemical agent to be detected is 2,2'-dichloroethyl sulphide.

10. An apparatus for detecting chemical agents according to claim 3 or 6, wherein the aforesaid monitoring means monitors the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence

of ion) values of 123 and 158, to detect 2,2'-dichloroethyl sulphide.

11. A method for detecting chemical agents which comprises introducing a test sample, heating the test sample at 110°C to 180°C, positively ionizing the resulting gas by corona discharge, subjecting the resulting ions to mass spectrometry, and detecting signals due to a chemical agent to be detected.

12. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which the test sample is negatively ionized therein by corona discharge is 110°C to 180°C; and a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry, wherein signals due to a chemical agent to be detected are detected.

13. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which the test sample is negatively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring ionic strength due to a chemical agent to be detected.

14. An apparatus for detecting chemical agents comprising an ion source into which a test sample is introduced and in which a preset temperature at which

the test sample is negatively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence of ion) values corresponding to a chemical agent to be detected.

15. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is negatively ionized therein by corona discharge is 110°C to 180°C; and a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry, wherein signals due to a chemical agent to be detected are detected.

16. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is negatively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring ionic strength

due to a chemical agent to be detected.

17. An apparatus for detecting chemical agents comprising a sample introduction section into which a test sample is introduced and in which a preset temperature at which the test sample is heated therein is 110°C to 180°C; an ion source where a preset temperature at which the gas produced by the heating is negatively ionized therein by corona discharge is 110°C to 180°C; a mass spectrometry section where the ions produced in said ion source are subjected to mass spectrometry; and a means for monitoring the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence of ion) values corresponding to a chemical agent to be detected.

18. An apparatus for detecting chemical agents according to any one of claims 12 to 17, wherein the aforesaid ion source is constructed so as to employ backflow type atmospheric pressure chemical ionization (APCI) in which the sample from the aforesaid sample introduction section flows toward a cat whisker capable of causing corona discharge.

19. An apparatus for detecting chemical agents according to any one of claims 12 to 17, wherein a drift voltage applied between small-hole-provided electrodes provided on both sides of the differential exhaust portion of the aforesaid mass spectrometry section is set at -30 V to -60 V.

20. An apparatus for detecting chemical agents

according to any one of claims 12 to 17, wherein the aforesaid chemical agent to be detected is 2-chlorovinylldichloroarsine.

21. An apparatus for detecting chemical agents according to claim 14 or 17, wherein the aforesaid monitoring means monitors the ionic strength of ions having mass-to-charge ratio (mass number of ion/valence of ion) values of 187 and 205, to detect 2-chlorovinylldichloroarsine.

22. A method for detecting chemical agents which comprises introducing a test sample, heating the test sample at 110°C to 180°C, negatively ionizing the resulting gas by corona discharge, subjecting the resulting ions to mass spectrometry, and detecting signals due to a chemical agent to be detected.